



Malaysian Communications and Multimedia Commission
Suruhanjaya Komunikasi dan Multimedia Malaysia

PUBLIC INQUIRY PAPER
Implementation of Mobile Number Portability (MNP)
in Malaysia

1st September 2005

This Public Inquiry Paper was prepared in fulfillment of Sections 55(2), 55(4) and 61 of the Communications and Multimedia Act 1998.

ABBREVIATIONS AND GLOSSARY

ACQ	All Call Query
BSS	Business support systems
Celcom	Celcom (Malaysia) Berhad
CMA	Communications and Multimedia Act 1998
Digi	DIGI Telecommunications Sdn. Bhd.
DN	Directory Number
ICP	Inter-carrier communication process
IN	Intelligent Network
ISUP	ISDN User Part
LNP	local number portability
Maxis	Maxis Communications Berhad
MCMC	The Malaysian Communications and Multimedia Commission
MNP	Mobile number portability
MVNO	Mobile virtual network operator
NP	Number Portability
NPDB	Number Portability Database
OSS	Operations support systems
PAC	Porting Authorization Code
PSTN	Public Switched Telephone Network
RN	Routing Number
SS7	Signaling System 7
TM	Telekom Malaysia Berhad

DEFINITIONS

All Call Query	A number portability solution where the directory number is translated to a routing number at the call-originating switch and progress the call based on the routing number.
Call conveyance costs	Costs associated with number portability which is related to additional call processing, signaling, call set-up, and call routing.
Call forwarding solution	A number portability solution where the call is routed to the original termination switch and call forwarded to the recipient switch.
Churn	The percentage of existing customers who give up service with an service provider within a given time period

Directory number	The number dialed by the calling party.
Donor network	The network that would be associated with a given directory number if the number has never ported. A number may be ported out of the donor network and subsequently ported back into the donor network.
Drop back solution	A number portability solution where call setup is achieved via the exporting switch, but the call is dropped back to the trunk switch before the physical call path is set up
Establishment costs	Costs which are incurred once to initially prepare the network to provide number portability services.
Fixed-to-Mobile portability	A subscriber changes from a Fixed Line Service Provider to a Mobile Service Provider and retains the same number.
IN Trigger	A SS7 query request
Location Portability	The ability for end users to retain the same geographic or non-geographic telephone number as they move from one permanent physical location to another.
Mobile-to-Fixed Portability	With this form of Portability, a subscriber changes from a Mobile Service Provider to a Fixed Line Service Provider and retains the same number.
Mobile-to-Mobile Portability	A subscriber changes Mobile Service Providers and retains the same mobile number
N Minus One (N-1) Routing	A number portability solution where the call is routed toward the switch identified by the directory number until the call setup reaches the network prior to the network that would be reached by routing solely on the directory number. In this "N-1" network, translate the directory number to a routing number and progress the call based on the routing number.
Number Portability	A service that enables residential and business telephone customers to retain their existing telephone numbers when they select a new service provider, or choose a new geographic location from which to receive local service, or order a new type of local service, such as ISDN rather than POTS service.

Number Portability Database	For a given network, the Number Portability Database contains the required mappings from directory number to routing number for queries that may be generated within that network.
Off net	Calls that originate on one network but terminate on another network
On-net	Calls that originate and terminate on the same network
Operator Identifier	The portion of the directory number which identifies the service provider
Originating network	The network where the call is initiated. In the context of mobile-originated calls, the originating network may or may not be the home network of the calling party.
Per-line Administrative Costs	Costs which are incurred by the service provider as a result of providing number portability to a customer including costs associated with fulfilling the port request and activation of porting of the number.
Pivot Routing	A number portability solution where the call is routed to the original termination switch. If the called number has been ported the call is released back to the pivot switch which translates the called number to a routing number and routes the call.
Portable number	A directory number is "portable" if it is in a number range that can be ported from one network to another. In the Malaysian context, it is expected that all mobile numbers will be portable and that no fixed numbers will be portable.
Ported number	A directory number is "ported" if the terminating network associated with the number is not the donor network. That is, the number is portable and has been ported out of the donor network.
Query On Demand	A variant of the pivot routing number portability solution.
Recipient network	The recipient network is the (non-donor) network to which a given directory number is ported. A number may be ported from one recipient network to another recipient network or back to the donor network.

Routing number	The routing number is a number in the same format as a directory number (typically reserved and not assigned to a called party; one per switch, MSC, or BTS) used as a network address for delivering calls to ported numbers. For non-ported numbers, the RN and DN are the same.
Service Portability	The ability for end users to retain the same geographic or non-geographic telephone number as they change from one type of service to another.
Service Provider Portability	The ability for end users to retain the same geographic or non-geographic telephone number as they change from one service provider to another.
Terminating network	For the purposes of number portability, the terminating network is the home network of the called party. If the called party is in a visited network, routing to the called party will occur after number portability has routed the call to the terminating network.
Transit network	A transit network is any network between the originating network and the terminating network. In some number portability options the donor network may be a transit network.

SUMMARY OF QUESTIONS FOR COMMENT

The MCMC welcomes comment on the following questions and issues raised in this Public Inquiry Paper. The list of questions for comment is summarized in the table below. Refer to the different section number for details of each question.

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Table 1: List of Questions

1. Introduction

1.1 Pursuant to the Ministerial Direction on Number Portability (Direction No. 2 of 2004) issued on the 10th Sept 2004, the Malaysian Communications and Multimedia Commission (MCMC) has initiated efforts to ensure the effective implementation of number portability for public cellular services in Malaysia ("Mobile Number Portability" or "MNP"). As part of our efforts, MCMC is undertaking a program to study the implementation of MNP in Malaysia and its implications and impacts to the industry, the service providers and the consumers. According to the program, the MCMC's goals include enhancing competition, deployment of advanced technologies, lowering of costs to users and stimulating economic development in Malaysia. Key to ensuring the development of competitive markets and expanding customer choice is the provision of MNP.

The MCMC hereby invites submissions from members of the public and participants of the industry on the questions and issues raised in this paper concerning, among others, the procedures, processes, costs implications and technical solutions involved in implementing MNP in Malaysia. Written submissions, in both hard copy and electronic form, should be provided to the MCMC in full on or before 12.00 noon, 29th November 2005.

Submissions should be addressed to:

The Chairman
Malaysian Communications and Multimedia Commission
63000 Cyberjaya
Selangor

Attention: Mr Norizan Ghazali
Telephone: +603-8688 8000
Fax: +603-86881001
Email: PI-MNP@cmc.gov.my

In the interest of fostering an informed and robust consultative process, the MCMC proposes to make submissions received available to interested parties upon request. Any commercially sensitive information should be provided under a separate cover clearly marked "CONFIDENTIAL". However, for any party who wishes to make a confidential submission, it would be of assistance if a "public" version of the submission were also provided.

1.2 **Clarification Session:** The MCMC proposes to undertake a clarification session at which clarifications on the paper will be made and stakeholders may raise queries in relation to the contents of the paper. This exercise is meant to facilitate the public in preparing the written submissions in response to this Public Inquiry. The clarification session will be held at the MCMC headquarters in Cyberjaya. The clarification session will be held on 22nd September 2005 at 9.30am.

2. Purpose of Public Inquiry

2.1 The Malaysian Communications and Multimedia Commission (MCMC) hereby seeks public comment on the implementation of mobile number portability (MNP) in Malaysia.

2.2 The purpose of this Public Inquiry is to invite interested parties to submit to the MCMC their comments on a number of issues related to the implementation of mobile number portability in Malaysia.

2.3 The comments submitted pursuant to this Public Inquiry will assist the MCMC in determining a variety of issues relating to the implementation of mobile number portability in Malaysia.

3. Background

3.1 This Public Inquiry is the first step to address the best method of implementing MNP and establishing rules and guidelines for its implementation framework and timeline. It is part of the successful program the Malaysia Government has embarked to liberalize the mobile telecommunications services in Malaysia. Over the last few years this program has brought about some change in the market with more services and lower prices becoming available. MNP is being introduced in order to establish market conditions that provide maximum choice, so that consumers will be able to switch service providers in order to take advantage of cheaper rates and attractive service offerings.

3.2 A major drawback to switching mobile service providers is that, at present, customers need to change their mobile telephone numbers if they change service providers.

Each of the mobile service providers in Malaysia is assigned a designated network code - 013/019 for Celcom, 016 for Digi and

012/017 for Maxis. Mobile subscribers are uniquely identified by the first 3 digits of the network code (01X-zzzzzz) of their mobile phone number.

The recent introduction of the common prefix 014 for mobile operators requires use of the 4th digit to identify the current service provider therefore this prefix has less significance than prefix mobile prefixes. These numbers will also be portable.

Any mobile subscriber who wishes to migrate to another service provider network will have no choice but to change their mobile phone number. MNP ensures that mobile phone customers can keep their current mobile number, when switching from one mobile service provider to another.

3.3 *Benefits of MNP*: MNP brings benefits to the consumers, the service providers and the industry in general.

3.3.1 Benefits to consumers: MNP benefits the consumers by the costs savings to the porting customer of not having to change mobile phone numbers, while at the same time having the freedom to choose the service provider with the best overall value. Business customers experience cost savings by avoiding the costs incurred when changing phone number which may include informing potential callers of the number change; changing letterheads or business cards; changing advertising material and potential loss of business. Callers to ported numbers also benefit from MNP. Examples include dialing wrong numbers; enquires to directory assistance and changing entries in directories, databases, and abbreviated dialers.

3.3.2 Benefits to service providers: All service providers benefit from MNP by allowing them to compete fairly and directly for customers by promoting their service and pricing advantages.

3.3.3 Benefits to industry: The main benefit of MNP to the mobile telecommunication industry as a whole is the stimulation to competition it causes. MNP increases competition by either lowering or eliminating the cost to customers to switch numbers thereby increasing the incentive of service providers to compete directly against one another for existing mobile users as well as new users. Increased competition encourages all service providers to improve the overall value currently offered to customers by improving the quality of service and offering new and innovative products and services. Service providers can only improve the value offered to customers

over the long term by improving the efficiency of their operations thereby improving the health of the industry as a whole.

3.4 The benefits that MNP brings to the marketplace have been recognized by many countries around the world as evidenced by the number of countries who have already implemented MNP. See table below.

Year	Country
1999	Hong Kong, Netherlands, United Kingdom
2000	Spain, Switzerland
2001	Denmark, Norway, Sweden
2002	Australia, Belgium, Germany, Italy, Portugal,
2003	Finland, France, Ireland, USA
2004	Greece, South Korea
2005*	Taiwan, Lithuania
2006#	Brazil, India, South Africa

* Implementation underway

In planning

3.5 The MCMC's goal is to recommend an approach to MNP that will expedite deployment - in a method that is convenient and inexpensive for consumers and efficient and cost effective for service providers. In addition the deployment of MNP should be implemented with minimal interruptions to any of the service provider networks.

3.6 MNP is defined as the ability for end users to retain the same geographic or non-geographic telephone number as they change from one mobile service provider to another.

4. Issues for Comment - General

4.1 The MCMC invites interested parties to submit written comments on any issue that they deem relevant with respect to the implementation of mobile number portability in Malaysia.

4.2 The MCMC particularly encourages comments from interested parties with respect to the following specific issues.

4.3 ***Role and Involvement of the MCMC***: The MCMC believes that for MNP to be effective, the regulator must take an active role in the three central factors:

- Subscriber awareness: does the subscriber understand MNP and does he/she know that it is available?
- Simplicity and speed: how easy is it to port a number and how long will it take?
- Porting cost: how much will it cost to port my number?

4.4 *Subscriber Awareness:* Subscriber awareness of MNP plays an essential role. Awareness is not only the responsibility of the mobile service providers. The regulator must also play an important role by making the subscriber not only aware of the service, but also their rights and safeguards. Many regulators publish consumer information about MNP in the form of frequently asked questions and answers. Apart from serving educational purposes, they complement the service descriptions that service providers typically publish.

Question 4.4

MCMC seek feedback on how the regulator should be involved in promoting awareness of MNP.

4.5 *Simplicity and Speed:* The simplicity and speed of the porting process plays an essential role. Subscribers want to be able to port as quickly and easily as they get phone service. A lengthy and poorly designed porting process is an inhibitor to porting. Subscribers do not want to have to go to the donor operator first to obtain port authorization, nor do they want to do endless paperwork.

4.5.1 MCMC recommends a 5 days porting process time for the first 12 months of MNP service rollout and subsequently reduced to 2 days after 12 months period. Such a phase-in approach is taken recognizing that in the early stages when mobile number portability is implemented, porting delays may occur.

Question 4.5.1

The MCMC seeks comment on the proposed porting process times.

4.5.2 MCMC recommends the following summarized porting process:

- The customer goes to the recipient operator for MNP service.

- The recipient operator checks whether this new customer is acceptable (bad debt scoring or black listing review, etc.).
- The recipient operator makes the notification that the number should be ported.
- The donor operator and all other operators are notified by of the new directory.
- On confirmation of the port, the recipient operator activates this number as one of its customers.

Question 4.5.2

The MCMC seeks comment on the following:

- a. The porting process.
- b. Whether or not the donor service provider should be allowed to contact the customer to try and retain the customer once the porting process has commenced.

4.6 **Porting Cost:** There are several cost-related elements that can act as disincentives to subscriber porting:

- Port fees imposed on subscribers
- Length of contract (postpaid)
- Retailers discouraging consumers for reasons of commissions

A sample of countries and their porting charges is shown below:

Country	User Charges (US\$)
Greece	24-36
Germany	30
Sweden	0
Belgium	0
Denmark	0
Finland	0

Question 4.6

MCMC seeks comments on the following issues:

- a. MCMC is considering implementing a porting fee payable by the customer of RM10 each time they port from one service provider to another.
- b. MCMC seeks views on whether or not operators should be allowed to offer incentives to potential customers for porting

from one service provider to another.

- c. MCMC seeks views on whether a minimum contract duration should be applied by service providers for new customers. If a minimum contract period should be applied MCMC are considering a maximum period for the contract period of 12 months.

5. Issues for Comment - Technical Solutions

5.1 **Technical Solutions:** The technical solution for MNP supports two primary functions, i.e. the provisioning processes for porting a number and the call routing to a ported number.

5.2 **Provisioning Processes:** In order to successfully provision the ported number end-to-end, the following tasks are necessary:

- Order Processing: the subscriber's request to a service provider to have a number ported,
- Port Provisioning: provisioning of an service provider's Operational Support System (OSS), Business Support Systems (BSS), and network(s), and
- Port Notification for Network(s) Synchronization: informing all service providers about the port.

Number portability normally starts with a subscriber requesting that the recipient network initiate the port of their number. The recipient operator is then faced with the task of interacting with the donor operator to decide on how and when to port the number. Two scenarios are possible: Bi-Lateral / Peer-to-Peer Approach and Centralized Clearinghouse Approach. All service providers must share data concerning which numbers have been ported. There are three possibilities: centralized database, distributed database, ore hybrid.

5.2.1 **Bi-Lateral/Peer-to-Peer Approach:** With this approach, service providers communicate directly with each other, in either a standard or non-standard manner. With the non-standard approach, individual commercial bilateral agreements are contracted between service providers, who must then know and manage the terms of each agreement. These agreements cover exchange of customer data, validation of customer data, and notification of executed ports. A standard approach to communicating with each other network can

begin to simplify some of the above, but either way, the approach may become complicated as new service providers enter the market.

5.2.2 Centralized Clearinghouse Approach: The Centralized Clearinghouse is a message processing system through which service providers communicate using the same set of rules for handling porting requests and exchanging information required for porting numbers. It provides the following key capabilities:

- Supports the exchange of information among all number portability processes across service providers, and provides a single central point of contact, allowing the use of a common protocol for initiating and responding to port requests. The common processes include the exchange of messages among participants, validation of these messages, and the notification of executed ports to all service providers.
- Maintains a reference database of mappings from directory number to routing number for all ported telephone numbers. The mappings are periodically broadcast and updated to all service providers as part of the number portability processes. Service providers may also, at any time, request data in order to synchronize their local routing database with the centralized reference database.
- Provides reports to the service providers and, if necessary, the regulator, including such information as porting history, and statistical summaries of ports initiated, ports completed, and ports rejected.

5.2.3 Hybrid Approach The hybrid model involves local databases that contain copies of the data contained in a single centralized reference database. Each local database is used and maintained separately, however whenever a change is made to one of the local database it is copied to the central database and distributed to all the other local databases.

5.3 Clearinghouse - The components of a clearinghouse typically consist of clearinghouse software, data center and clearinghouse support staffs.

5.3.1 Clearinghouse software includes the centralized reference database, which will serve as the repository for all ported numbers in a given country. It also includes order management software to

implement the Number Portability processes for handling porting requests as well as the interfaces to the application.

5.3.2 Data center facilities host the clearinghouse software and hardware. This includes the computer hardware used to run the clearinghouse software system, as well as network access and connection facilities for service providers to access the clearinghouse either directly or via the internet. Environmental control, backup power, security and disaster recovery also need be provided to ensure the continuous availability of porting services to mobile service providers and their customers.

5.3.3 Clearinghouse support staffs administer and operate the clearinghouse system. This includes the Help Desk functions such as trouble ticketing, problem resolution, logon administration, and training. It also includes personnel to perform system administration, hardware, software and network support, and data back-up.

5.4 **Database Options:** Number Portability Databases containing information on the network with which ported numbers are associated are used in all implementations of mobile number portability. Typically, the management of number databases is either centralized or distributed although it is also possible to have a hybrid approach.

5.4.1 **Centralized Database:** The centralized model uses a single reference database which contains data for all mobile numbers, or for all ported numbers. Generally, a centralized database is managed by a third party clearinghouse to run the actual operation and maintenance the database.

5.4.2 **Distributed Database** The distributed model involves multiple databases which contain subsets of the total data. The full set of information about all mobile numbers or ported numbers is only available from the separate databases taken as a whole.

5.5 MCMC recommends a centralized clearinghouse approach that utilizes a centralized national number portability database to respond to queries from any network.

Question 5.5

MCMC seeks comment on a centralized clearinghouse approach that utilizes a centralized national number portability database to respond to queries from any network.

5.5.1 MCMC will oversee the establishment of the clearinghouse owned, managed and operated by a third party.

Question 5.5.1

The MCMC seeks comment on the establishment of a third party clearinghouse to facilitate efficient implementation of mobile number portability in Malaysia.

5.6 **Call Routing:** There are a number of options for routing a call to a portable number, distinguished by where and how the translation occurs, namely Call Forwarding, Dropback, Pivot Routing, N-1 Routing and All Call Query. Each option has its own advantages and disadvantages.

5.6.1 **Call Forwarding Option:** The originating network will not recognize and translate any ported numbers but has to pass them back to the donor network. The donor network uses a call forwarding mechanism to translate the ported numbers before the calls are routed to the recipient network.

5.6.2 **Dropback Option:** The donor network checks whether the number is ported, and if it is, releases the call back to the originating network together with information identifying the correct terminating network.

5.6.3 **Pivot Routing Option:** Route the call to the switch identified by the directory number. If the directory number has been ported out of this switch, invoke the SS7 Pivot Routing capability to release one or more of the call segments. At the Pivot switch (where the release of call segments ends and forward call routing resumes), translate the directory number to a routing number and progress the call based on the routing number.

5.6.4 **N Minus One (N-1) Routing Option:** Route the call toward the switch identified by the directory number until the call setup reaches the network prior to the network that would be reached by routing solely on the directory number. In this "N-1" network, translate the directory number to a routing number and progress the call based on the routing number.

5.6.5 **All Call Query Option:** This approach is also referred to as “Intelligent Network (IN) and Database Option” The originating network acts as a service switching point which interrogates a separate database, also known as “Service Control Point,” to translate any ported numbers into the network addresses before the calls are routed directly to the recipient network, without having to route the calls back to the original donor network.

5.6.6 The MCMC recommends an All Call Query approach for call routing.

Question 5.6.6

MCMC seeks comment on the All Call Query approach for call routing.

5.7 **Signaling Protocol:** When a directory number has been ported and a routing number is used to progress the call setup (in each of the number portability solutions with the exception of the Call Forwarding solution) there is a need to deliver the (dialed) directory number to the recipient switch. The internationally standard options to accomplish this are:

1. Populate the ISUP Called Directory Number parameter with the directory number.
2. Populate the ISUP Called Party Address with a concatenation of the directory number followed by the routing number.
3. Populate the ISUP Called Party Address with a concatenation of the routing number followed by the directory number.

5.7.1 The MCMC recommends that:

1. Before a routing number has been derived, the directory number is carried in the ISUP Called Party Address.
2. After a routing number has been derived, the directory number be carried in the ISUP Called Directory Number and that the ISUP Called Party Address only carry the routing number.

Question 5.7.1

MCMC seeks comment on this approach of populating the ISUP Called Party Address.

6. Issues for Comment – Impacts of MNP

6.1 Impacts of MNP to service providers: The introduction of MNP will impact several aspects of the Malaysian telecommunications industry.

6.2 Loss of Service Provider Identity: Currently the mobile phone numbers in use have the form of [01A-XXXXXXX] whereby A denotes the service provider serving the subscriber. When MNP is introduced, the service provider identifier A in the directory number may no longer identify the customer's service provider. The identity of a mobile service provider prefix is typically derived from the directory number for various purposes; including tariff transparency, interoperability with fixed networks and branding and promotion and billing of SMS content providers. The above impacts will require several changes by mobile service providers in their internal business operations, marketing strategies and customer relationship.

Question 6.2

The MCMC seeks comment on what, if any, additional impacts the loss of identifier will have on mobile service provider operations.

6.3 Tariff Transparency: Tariff transparency refers to the ability of a user to know the price of a call in advance of making it. MNP takes away the users' ability to distinguish between calls to specific service provider networks via the prefix of the called number. The issue is that a mobile user may call another mobile user who has ported their number, a condition that will be unknown to the originating subscriber. The originating user might have expected to pay a specific charge but in view of the port will now incur a higher charge for the call. This raises the question of how will users be notified about these charges. In Malaysia, there is a significant difference in price for a call between mobile users served by the same service provider (on-net) versus a call between mobile users served by different service providers (off-net).

6.3.1 The issue of tariff transparency is recognized in many of the countries in which MNP is implemented or planned for implementation. Many countries have provided a “telephone information service” to promote tariff transparency on calls to ported numbers by ensuring that mobile users have access to information that enables them to predict the cost of a call to another mobile number. This information may be provided via a recorded telephone information service (IVR) or an SMS information service, which provides the correct tariff information on input by the user of the number which will be called.

6.3.2 An alternative approach is to provide an audible warning (a tone alert or announcement) at the beginning of a call that indicates it will be charged at an off-net rate. This could potentially give the caller the option to abandon the call at no charge. Under the tone alert approach, the aural signal would be generated and inserted by the originating mobile network and receipt would not be dependent on the functionality of the originating customer’s handset.

Question 6.3.2

The MCMC seeks comment on ways of achieving tariff transparency with respect to calls made to/from mobile numbers.

6.4 ***Interoperability with Fixed Networks***: Fixed network service providers will need to route calls to portable numbers so interconnection agreements will need to be reached. At first glance, it may appear that the fixed line service providers would not need to account for MNP; calls would simply be delivered as today to the donor operator. However, if the current interconnect charging regimen remains, there will be some motivation for the fixed network to deliver the call as close to its destination as possible, i.e., there will be a tradeoff for the fixed line service provider between:

- a) Implementing number portability so that the call may be delivered to the appropriate mobile network in the appropriate geographic region, or
- b) Compensating the donor network for re-directing the call to the recipient network in the appropriate geographic area.

Question 6.4

MCMC seeks feedback on whether fixed line service providers are to be compensated and if so how they should be compensated for cost

associated with MNP.

6.5 Branding and Promotion: All Malaysia mobile service providers have previously branded on their network prefix (01X). With the arrival of MNP, such marketing promotions will no longer be valid since the prefix will not have any service provider significance. So service providers will have to use other tactics to retain and expand their customer base.

Question 6.5

MCMC seek to understand what are the impacts of MNP to the mobile service providers' branding and promotion strategies and activities.

7. Issues for Comment – Operations Support Systems

7.1 Operations Support Systems: Each of the three Malaysian mobile service providers has advanced operations support systems (OSSs) that serve their subscriber base. These systems span customer service where orders are placed, to network provisioning and service activation, and conclude with billing.

7.1.1 Customer Service: The objective is to ensure that MNP should not significantly disturb the automation and workflows that are presently in place. This means that a porting customer must be able to approach a service provider's customer service center, retailer or dealer in shopping centers and other remote locations as they do today. This is essential to maintain the convenience and simplicity that mobile users experience today when they subscribe for mobile service. Procedures and workflows will clearly have to be adjusted to accommodate MNP.

7.1.2 Order Management: The arrival of MNP will require modifications to service order application forms or screens that contain detailed information about the subscriber. Additional information will now need to be reflected. If one assumes that a porting subscriber will first approach the recipient operator (this is the norm in practically all MNP implementations), then MNP-specific data such as the subscriber number and donor operator will need to be gathered. An important data element will be the date and time of that the port will be activated. The OSS that supports the order management function

will therefore have to be modified to recognize and process each of these additional data elements that have been introduced by MNP.

7.1.3 Network Provisioning: The primary function here is to activate the port on the date and time specified on the service order. This will be followed by notifying donor and recipient networks of the porting of the subscriber number and entering the recipient operator's identity in the relevant network databases in timeframes commensurate with market offerings of the porting service.

7.1.4 Accounting and Billing: The effects on these systems will be considerable as the accounting and billing systems of all relevant carriers and service providers will have to be advised that the customer has ported to ensure that calls from and to the now ported number are billed correctly. Enhanced charging and billing capabilities to accommodate new rating plans and the process and system for revenue exchange and compensation will be necessary. The extent of the changes will be determined by the cost recovery method for on-going costs. Prompt customer billing is essential for all service providers. In particular, mobile service providers may experience a fraud problem from customers who take advantage of a multi-month delay in billing some calls, e.g., roaming calls. By frequently changing service providers the customer may avoid paying the delayed charges. MNP has the potential to aggravate this situation by allowing the customer to change service providers without taking a number change.

7.1.5 Once the transfer has occurred, the service provided by the donor operator should be cancelled. A final bill must be generated. However, the number cannot be classified as available for re-issue, and the current directory listing (if any) would need to be retained. Responsibility for keeping up to date records of directory listing details would then revert to the recipient carrier.

Question 7.1.5

MCMC seeks cost estimates for the necessary modifications to OSSs for an all call query and centralized database approach to MNP from both mobile service providers / fixed line service providers.

8. Issues for Comment – Costing

8.1 Network Costs: These are costs incurred in preparing the network for providing the number portability services. Establishment costs include costs that are incurred as a result of establishing network and operational capabilities to provide the service in question. These are costs that are required once in order to provision the service. Examples would be upgrade of exchanges with NP triggers, Right-To-Use fees.

Question 8.1

MCMC seeks cost estimates for the necessary modifications to the network for an all call query and centralized database approach to MNP from both mobile service providers / fixed line service providers.

8.2 Per-Line Administrative Costs: These costs are incurred by the service provider as a result of providing the service. These costs involve costs associated with fulfilling the request for service for activation of porting of a number for a particular customer line. These costs which vary depending the MNP approach used and may include the cost of populating the call forwarding number (call forwarding approach); additional cost to support the database (centralized database approach); cost of modification of subscriber data in network elements, customer care and billing systems or cost of modifying inter-operator accounting and billing systems.

Question 8.2

MCMC seeks estimated per line administrative costs (exclusive of the clearinghouse fixed fee and per transaction fee) for an all call query and centralized clearinghouse centralized database approach to MNP from both mobile service providers / fixed line service providers.

8.2.1 The MCMC recommends imposing a fixed fee plus transaction fee for each database access and porting transaction for the centralized clearinghouse centralized database approach.

Question 8.2.1

The MCMC seeks comment on the proposed clearinghouse charging mechanism.

8.3 Call Conveyance Costs: These are cost associated with number portability are related to additional call processing, signaling, call set-up, and routing. The additional call processing is required for the triggering associated with database queries for the ACQ approach. The call forwarding approach also required additional processing to forwarded calls to ported numbers. The ACQ approach requires addition processing for the routing schemes required to route ported calls. The additional signaling is required for database queries and the signaling associated with ported calls. Call set-up delays cause additional costs by demanding greater capacity in the switch and transmission network elements used during call set-up. Additional routing is required to route calls to ported numbers especially when a call forwarding approach is used. Conveyance costs vary greatly from network to network and are dependent on volume of ported numbers, implementation approach, volume of queries, and network characteristics

Question 8.3

MCMC seeks estimated call conveyance costs for an all call query and centralized database approach to MNP from both mobile service providers / fixed line service providers.

8.4 Costs Recovery: The MCMC will establish guiding principles to ensure that the cost recovery process is equitable in terms of ensuring the appropriate allocation of costs resulting from the introduction of mobile number portability between service providers. These principles include cost causation (examining the relevant costs); cost causality (requiring that the customer who decides to port a telephone number incur appropriate costs); cost minimization; and ensuring effective competition.

Question 8.4

The MCMC seeks comment on the general principles which will guide cost recovery for mobile number portability.

8.5 Porting Costs: The MCMC will establish guidelines as to the amount of costs that can be charged by the donor service provider to the recipient service operator each time a customer ports their number.

Question 8.5

The MCMC seeks comment as to the costs involved by the donor operator and if they should be compensated for these costs by the recipient operator. If they should be compensated should the recipient pay all or part of the costs.

9. Issues for Comment – Implementation Plan

9.1 ***Implementation timeframe***: It is the goal of the MCMC to establish a realistic implementation timeframe, while also recognizing that the expediency by which mobile number portability is implemented will result in greater choice for consumers and enhancement of competition among mobile service providers. MCMC is targeting a duration of 12 to 15 months for implementing the proposed technical solution.

Question 9.1

The MCMC seeks comment on the proposed technical solution implementation timeframe

9.2 ***Service Deployment timeframe***: MCMC is targeting for the deployment of mobile number portability service to the Malaysia public in a 15 to 18 month timeframe.

Question 9.2

The MCMC seeks comment on the proposed deployment timeframe